

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): ~~Portable~~ A portable control, program and/or teach terminal provided for the connection to a control unit (5) of movements according to multiple axes of an automatic apparatus (1) bearing a tool (4), ~~such as a robot or similar~~, the terminal (6) having a longitudinally extended body defining a first portion (10) and a second portion (11) comprising an area of union to the first portion (10), wherein in correspondence with a front side of the first portion (10) a display device (D) is provided and in correspondence with a front side of the second portion (11) a multiplicity of keys is provided, said multiplicity comprising:

[[-]] a plurality of motion keys (14) able to be operated manually to provide the control unit (5) with a respective command signal for the apparatus (1), the command signal being aimed at causing the tool (4) to execute a rotation or a translation motion about or along an axis corresponding to the operated motion key (14),

[[-]] a plurality of teaching keys (15-24, 26), able to be operated manually for programming the control unit (5) and/or controlling the apparatus (1) and/or storing a position reached by a predefined point (TCP) of the tool (4) as a result of a motion of the apparatus (1),

~~characterised in that~~ wherein

[[-]] the second portion (11) of the body of the terminal (6) has a width which progressively decreases until reaching said area of union,

~~[[-]] at least one between said plurality of motion keys (14) and said plurality of teaching keys (15-24, 26)~~ comprises a first and a second series of keys (14) being positioned each along a respective longitudinal side of the second portion (11), preferably in a substantially symmetrical fashion to each other, and

~~[[-]] the other between said plurality of motion keys (14) and said plurality of teaching keys (15-24, 26)~~ comprises a group of keys (15-22, 26) being positioned within or close to said area of union.

2. (currently amended): ~~Terminal~~ The terminal as claimed in claim 1, ~~characterised in that~~ the first series consists of keys for controlling translation movements and the second series consists of keys for controlling rotation movements.

3. (currently amended): ~~Terminal~~ The terminal as claimed in claim 1, ~~characterised in that~~ the body comprises a rear part ~~wherein~~ in which a longitudinally extended recess (12) is defined, having two opposite longitudinal sides, each longitudinal side extending substantially parallel to a respective side surface of the second portion.

4. (currently amended): ~~Terminal~~ The terminal as claimed in claim 1, ~~characterised in that~~ ~~the terminal (6) comprises~~ further comprising a safety device of the “dead man” type (13) and ~~that the body comprises~~ comprising a rear part wherein a longitudinally extended recess (12) is defined, from each of two opposite longitudinal sides of the recess (12) a respective elongated button projecting towards the interior of the recess ~~an elongated button (13)~~, each elongated button (13) being part of the safety device.

5. (currently amended): ~~Terminal~~ The terminal as claimed in claim 1, ~~characterised in that~~

~~it comprises~~ further comprising selection means (18), able to be operated manually to select a desired co-ordinate system among a plurality of co-ordinate systems ("Base", "Tool", "Joints") stored in the control unit (5), that the operation of the motion keys (14) depends on a selection made through the selection means (18) and that said command signal is aimed at causing the tool (4) to execute a rotation or a translation motion about or along an axis corresponding to the operated motion key (14), in the co-ordinate system ("Base", "Tool", "Joints") selected using the selection means (18).

6. (currently amended): ~~Terminal~~ The terminal as claimed in claim 5, characterised ~~in that it further comprises~~ further comprising additional motion control means (40, 41), able to be operated manually instead of the motion control means (14), to provide the control unit (5) with a respective signal for controlling the apparatus (1) aimed at causing a displacement of the predefined point (TCP) of the tool (4) relative to a previously set reference point (CO), where

[[-]] the position of the reference point (CO) is capable of being modified,

[[-]] the terminal (6) comprises means (D; T) for modifying the position of the reference point (CO),

[[-]] the signal for controlling the apparatus (1) generated as a result of the operation of the additional motion control means (40, 41) is independent from the co-ordinate system ("Base", "Tool", "Joints") selected through the selection means (18).

7. (currently amended): ~~Terminal~~ The terminal as claimed in claim 6, characterised ~~in that the~~ wherein said additional motion control means (40, 41) ~~are~~ is positioned in a central part of the second portion (11).

8. (currently amended): ~~Terminal~~The terminal as claimed in claim 6, characterised ~~in that the~~wherein said additional motion control means (40, 41) ~~are~~is positioned between the first and the second series of motion keys ~~(14)~~.

9. (currently amended): ~~Terminal~~The terminal as claimed in claim 6, characterised ~~in that the~~wherein said additional motion control means (40, 41) ~~are~~is able to be operated to cause Cartesian displacements of the predefined point of the tools ~~(TCP)~~ relative to the set reference point ~~(CO)~~.

10. (currently amended): ~~Terminal~~The terminal as claimed in claim 6, characterised ~~in that the~~wherein said additional motion control means (40, 41) can be operated to cause angular or rotary displacements about a respective axis of the predefined point of the tools ~~(TCP)~~.

11. (currently amended): ~~Terminal~~The terminal as claimed in claim 6, characterised ~~in that~~wherein the reference point ~~(CO)~~ is representative of the position of the terminal ~~(6)~~, and hence of a user ~~(7)~~ who supports it, relative to the apparatus ~~(7)~~.

12. (currently amended): ~~Terminal~~The terminal as claimed in ~~claim~~claim 2, characterised ~~in that the~~wherein said additional motion control means (40, 41) can be operated to cause a displacement of the predefined point of the tool ~~(TCP)~~ closer, farther away, to the right, to the left, upwards or downwards relative to the position of the terminal ~~(6)~~, and hence of the user who supports it ~~(7)~~.

13. (currently amended): ~~Terminal~~The terminal as claimed in claim 11, characterised ~~in that the~~wherein said additional motion control means (40, 41) can be operated to cause a rotation of the predefined point of the tool ~~(TCP)~~ about a respective axis, counter-clockwise or

clockwise to the right, counter-clockwise or clockwise towards the position of the terminal-(6)
and counter-clockwise or clockwise upwards.

14. (currently amended): ~~Terminal~~The terminal as claimed in claim 11, ~~characterised~~
~~in that the~~wherein said additional motion control means (40, 41) comprise a compass knob (40)
able to be selectively operated in four lateral areas thereof to cause, in one of its operating
modes, a displacement of the predefined point of the tool-(TCP) closer, farther away, to the right
or the left relative to the position of the terminal-(6).

15. (currently amended): ~~Terminal~~The terminal as claimed in claim 11, ~~characterised~~
~~in that the~~wherein said additional motion control means (40, 41) comprise a dual pressure key
(41), able to be operated selectively at its two end areas to cause, in an operating mode thereof, a
displacement of the predefined point of the tool-(TCP) upwards or downwards relative to the
position of the terminal-(6).

16. (currently amended): ~~Terminal~~The terminal as claimed in claim 14, ~~characterised~~
~~in that~~wherein the compass knob (40) can be selectively operated in four lateral areas thereof to
cause, in an additional operating mode, a displacement of the predefined point of the tool-(TCP)
about a respective axis, counter-clockwise and clockwise to the right and counter-clockwise and
clockwise towards the position of the terminal-(6).

17. (currently amended): ~~Terminal~~The terminal as claimed in claim 15, ~~characterised~~
~~in that~~wherein the dual pressure key (41) can be selectively operated at two end areas thereof to
cause, in an additional operating mode, a rotation of the predefined point of the tool-(TCP) about
a respective axis, counter-clockwise or clockwise upwards.

18. (currently amended): ~~Terminal~~The terminal as claimed in claim 6, characterised in that the wherein said means (D; T) for modifying the position of the reference point-(CO) comprises an information input page capable of being displayed on the display device-(D).

19. (currently amended): ~~Terminal~~The terminal as claimed in claim 6, characterised in that the wherein said means (D; T) for modifying the position of the reference point-(CO) comprise means for generating graphic information on the display device-(D), the graphic information being representative of the position of the reference point-(CO) relative to the robot (1).

20. (currently amended): ~~Terminal~~The terminal as claimed in claim 19, characterised in that the wherein said means for generating graphic information comprise

[[-]] means for generating on the display-(D) a first symbol-(CO), representative of the reference point,

[[-]] means for generating on the display-(D) a second symbol-(PR), representative of the robot-(1);

[[-]] means for moving the first symbol-(CO) relative to the second symbol-(PR) using the first key-(20), in particular along a substantially circular trajectory-(TC).

21. (currently amended): ~~Terminal~~The terminal as claimed in claim 6, characterised in that the wherein said means-(D; T) for modifying the position of the reference point-(CO) are part of a system-(T, R) for the automatic recognition of the angular position of the terminal-(6) relative to the apparatus-(1).

22. (currently amended): ~~Terminal~~The terminal as claimed in claim 21, ~~characterised in that~~wherein the automatic recognition system-(T, R) comprises signal emitter means-(T) and signal receiving means-(R), the signal emitter means-(T) being operatively associated to one between the terminal-(6) and the robot-(1) and the signal receiver means-(T) being operatively associated to the other between the terminal-(6) and the apparatus-(1).

23. (currently amended): ~~Terminal~~The terminal as claimed in claim 1, ~~characterised in that~~wherein said group of keys comprises one or more keys selected in the group consisting of:

[[-]] at least a key-(15) for varying the translation velocity of the robot-(1), positioned in particular in the right part of the second portion-(11), towards the centre thereof;

[[-]] a key-(16) for starting a sequence of motions of the robot-(1), positioned in particular in the right part of the second portion-(11), towards the centre thereof;

[[-]] a key-(17) for stopping a motion of the robot-(1), positioned in particular in the right part of the second portion-(11), towards the centre thereof;

[[-]] a key-(18) for selecting a desired co-ordinate system among a plurality of co-ordinate systems, positioned in particular in the left part of the second portion-(11), towards the centre thereof;

[[-]] a repetition key-(19), which, when pressed, causes the robot-(1) to trace back one or more previously executed motions, positioned in particular in the right part of the second portion (11), towards the centre thereof;

[[-]] a key-(26) for commanding the execution of individual steps of a previously set sequence of motions of the robot-(1), positioned in particular in the right part of the second portion-(11), towards the centre thereof;

[[-]] a plurality of programming keys-(20-23) positioned in particular in the left part of the second portion-(11) and comprising at least multiple cursor keys-(20), a data recording key (21), a data modification key-(22);.

24. (currently amended): ~~Terminal~~The terminal as claimed in claim 1, characterised ~~in that~~wherein in the first portion-(10), laterally to the display device-(D), are positioned one or more function keys-(TF1, TF2, TF3).

25. (currently amended): ~~Terminal~~The terminal as claimed in claim 1, characterised ~~in that~~wherein in correspondence with an end area of the first portion-(11) are positioned a key selector-(31) and a mushroom head safety push-button-(32).